Geophysical Research Abstracts
Vol. 16, EGU2014-7188, 2014
EGU General Assembly 2014

Effects of ice storm on forest ecosystem of southern China in 2008

Shaoqiang Wang[1], Lei Zhou[1], Weimin Ju[2], Kun Huang[1]

[1]*Key Lab of Ecosystem Network Observation and Modeling, Institute of Geographical Sciences and Natural Resources Research, Beijing, 100101, China*

2Internatinal Insitute for the Earth System Science, Nanjing University, Nanjiing, 210093, China

Shaoqiang Wang

Institute of Geographical Sciences and Natural Resources Research, Chinese Academy of Sciences, Key Lab of Ecosystem Network Observation and Modeling, Beijing, China (sqwang@igsnrr.ac.cn)

Evidence is mounting that an increase in extreme climate events has begun to occur worldwide during the recent decades, which affect biosphere function and biodiversity. Ecosystems returned to its original structures and functions to maintain its sustainability, which was closely dependent on ecosystem resilience. Understanding the resilience and recovery capacity of ecosystem to extreme climate events is essential to predicting future ecosystem responses to climate change. Given the overwhelming importance of this region in the overall carbon cycle of forest ecosystems in China, south China suffered a destructive ice storm in 2008. In this study, we used the number of freezing day and a process-based model (Boreal Ecosystem Productivity Simulator, BEPS) to characterize the spatial distribution of ice storm region in southeastern China and explore the impacts on carbon cycle of forest ecosystem over the past decade. The ecosystem variables, i.e. Net primary productivity (NPP), Evapotranspiration (ET), and Water use efficiency (WUE, the ratio of NPP to ET) from the outputs of BEPS models were used to detect the resistance and resilience of forest ecosystem in southern China. The pattern of ice storm-induced forest productivity widespread decline was closely related to the number of freezing day during the ice storm period. The NPP of forest area suffered heavy ice storm returned to normal status after five months with high temperature and ample moisture, indicated a high resilience of subtropical forest in China. The long-term changes of forest WUE remain stable, behaving an inherent sensitivity of ecosystem to extreme climate events. In addition, ground visits suggested that the recovery of forest productivity was attributed to rapid growth of understory. Understanding the variability and recovery threshold of ecosystem following extreme climate events help us to better simulate and predict the variability of ecosystem structure and function under current and future climate change.